

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Dana Alexa Totir et al.

Art Unit : 1745

Serial No. : 10/800,905

Examiner : Raymond Alejandro

Filed : March 15, 2004

Conf. No. : 1479

Title : NON-AQUEOUS ELECTROCHEMICAL CELLS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

**DECLARATION OF DANA ALEXA TOTIR, KIRAKODU S.
NANJUNDASWAMY AND MICHAEL POZIN UNDER 37 C.F.R. § 1.131**

1. We are the inventors of the inventions claimed in the above-captioned patent application.

2. Two laboratory notebook pages from a laboratory notebook of Dana Alex Totir are attached. The notebook pages are signed by Ms. Totir and are dated prior to September 12, 2003. The two pages are true and complete copies from the original notebook, except that the dates on the laboratory notebook pages have been whited out and information is highlighted as described below.

3. The laboratory notebook pages demonstrate that electrochemical cells covered by claims 1-5, 8-12, 14-24, 28, 31-35, and 39-43, and 45-46 were made and used prior to September 12, 2003.

(a) Some of the information on the notebook pages is highlighted for convenience. See in particular the highlighted information next to "Cell #1" on page 2489-110 and "Cell #2" on page 2489-111. The electrochemical cells were coin cell models that included a plastic housing, a cathode including " ϑ -EMD" (ϑ -electrolytic manganese dioxide) on a "primed Al" (aluminum) current collector. The aluminum current collector in turn was pressed on an "SS grid". SS is stainless steel, and the aluminum current collector thus was in contact with a second metal surface (the stainless steel) different from the surface of the aluminum current collector. The cells included a "Li" (lithium) anode and an electrolyte including "0.05 M" (page 2489-110) or "0.03 M" (page 2489-111) LiBOB. LiBOB is lithium bis(oxalato)borate. Thus, the electrochemical cells described on laboratory notebook pages 2489-110 and 2489-111 include all of the requirements of claims 1-2, 5, 8-12, 31-35, and 45-46.

(b) Laboratory notebook pages 2489-110 and 2489-111 refer to "LiBOB in TDE10" in the highlighted information next to "Cell #1" and "Cell #2". TDE10 is an internal name for an electrolyte that includes, among other ingredients, lithium trifluoromethanesulfonate. Thus, electrochemical cells on laboratory notebook pages 2489-110 and 2489-111 also include all of the requirements of claims 3 and 4.

(c) The aluminum cathode current collector used in the electrochemical cells on laboratory notebook pages 2489-110 and 2489-111 had a size of at least one dimension greater than 2 millimeters. Thus, the electrochemical cells on laboratory notebook pages 2489-110 and 2489-111 include all of the requirements of claims 14-16.

(d) The electrochemical cells on laboratory notebook pages 2489-110 and 2489-111 were designed to be discharged once and then discarded, and thus are primary electrochemical cells as opposed to secondary (rechargeable) electrochemical cells. Thus, the electrochemical cells on laboratory notebook pages 2489-110 and 2489-111 meet all of the requirements of claims 17-24, 28, and 39-43.

4. We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that those statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Attorney's Docket No.: 08935-270001 / M-4996/Z-
03622



Dana Alexa Totir

09/13/07

Date

Kirakodu S. Nanjundaswamy

September, 07, 2007

Date

Michael Pozin

September 12, 2007

Date

K corrosion: can all this were inconsistent (results very on a large range)

Must test in more ref. cells.

Tests:

- K-based cathodes formed on 35 grid in Ag contact
- 100, 100-50 test
- corrosion of 316L can and of K alloye @ 3.8V (n 33)

Impedance measurement with Ag pseudo-reference electrode.

- 3-electrode all w. Ag pseudo reference electrode, 50 counts and reference electrode
- measure OCV of Ag electrode w. Li reference in 730m
- Cyclic Ag (Ag) in 730m in Potassium in PC/PEO
- Cyclic Ag (Ag), Li(CO₂) in Potassium / PC/PEO
- Ag (Ag), Ag(R), Li(CO₂) in Potassium (PC/PEO)

To compare the peak potential for Ag (R) and Li(RC)

To find out the potential difference.

Cell 1

0.01M LiClO₄ in primed K, 70 control 1651 732

present a 35 grid w. galvanised K₂SnO₃ (45)

3500 Cycles, 0.05 M Li(CO₂) in Potassium (PC/PEO)

1x2 60, 1000 cycle cell

100C test (33 mAh)

Temperature

- Et 2110 a1. cor - Au(W), Li(R), Li(C), 1mM Potassium in 730m, CV between 2.7-3.7 V @ 20 mV/sec.
- Et 2110 a2. cor - Ag(W), Au(C), Li(R), 1mM Potassium in 730m - open circuit experiment to monitor Ag potential w. Li
- Et 2110 a3. cor - Au(W), Li(C), Ag(R) - 1mM Potassium in 730m - 0-0.7 V vs. ref @ 20 mV/sec
- Et 2110 a4. cor - Au(W), Li(C), Ag(R) - 1mM Potassium in 730m - CV -0.6 - 0 V vs. ref @ 20 mV/sec
- Et 2110 a5. cor - same as above - CV -0.6 - 0 V vs. ref @ 20 mV/sec

Witnessed & Understood by me,

Monks

Date

Recorded by

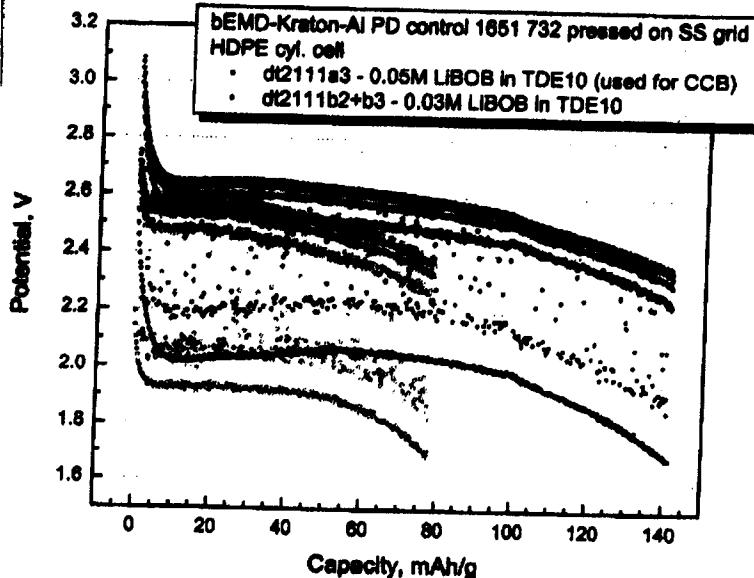
Date

Date

J. A. M.

Subject Matter

- dt 2111 a1. cor - cell #1 dissolved in prop -10 - stopped after 170 pulses
NEC 60 @ 3.3 mAh
OCV for 2h (Cell #1)
- dt 2111 a2. cor - Cell #1, NEC 60, 3.3 mAh, 600 pulses
- **Cell #2:** 13 - 0.05M LiTFSI in propylene carbonate, 1651 732
pressed on 55 grid w. 90°C/1h 160°C
d600 Cylindrical, 1ml 0.08M LiBOB in TDE10 (propylene carbonate)
1x2 Li, 1600 cyl. cell.
- dt 2111 b1. cor - open circuit, 2L
- dt 2111 b2. cor - NEC 60, 3.3 mAh, 500 pulses
- dt 2111 b3. cor - NEC 60, 3.3 mAh, additional n. of pulses
(collected next day)



| | | | |
|-----------------------------------------------|------|----------------------------|------|
| Witnessed & Understood by me, <i>Marko</i> | Date | Recorded by <i>John</i> | Date |
| | Date | | |